

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-196358
 (43)Date of publication of application : 28.07.1998

(51)Int.CI. F01N 7/08
 F16L 27/12

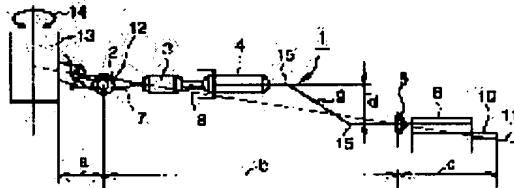
(21)Application number : 09-003103	(71)Applicant : TOYOTA MOTOR CORP
(22)Date of filing : 10.01.1997	(72)Inventor : SHIMOJI KOJI TAKANO MASANORI IMAGAWA TOSHIYUKI

(54) EXHAUST PIPE DEVICE FOR INTERNAL COMBUSTION ENGINE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an exhaust pipe device for an internal combustion engine to prevent a twist from being applied on a vibration cut-off mechanism.

SOLUTION: An exhaust pipe device 1 for an internal combustion engine comprises exhaust pipes 7, 8, and 9 connected to a transversely mounted internal combustion engine 13 and having a bend 15 obliquely bending in the direction of the width of a vehicle, and vibration cut-off mechanism 12 and 9 arranged midway of an exhaust system. The vibration cut-off mechanisms 12 and 9 are arranged on or right in the vicinity of the inertia main shaft 11 of the exhaust pipe device 1, and the axial directions of the vibration cut-off mechanism 12 and 9 are made to approximately coincide with a position within a vertical surface containing an internal main shaft 11.



LEGAL STATUS

[Date of request for examination]	20.12.1999
[Date of sending the examiner's decision of rejection]	
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	3252735
[Date of registration]	22.11.2001
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

* NOTICES *

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] In the exhaust pipe which is connected to a horizontal type internal combustion engine, and has crosswise [car] the deflection at which it turns aslant, and the exhaust pipe equipment for internal combustion engines equipped with the oscillating breaker style arranged in the middle of an exhaust air system Exhaust pipe equipment for internal combustion engines characterized by doubling the shaft orientations of said oscillating breaker style with vertical plane inboard including said principal axis of moment mostly while having arranged said oscillating breaker style by plane view to the principal-axis-of-moment top of said exhaust pipe equipment, or the latest of a principal axis of moment.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a horizontal type internal combustion engine's exhaust pipe equipment.

[0002]

[Description of the Prior Art] As JP,2-103119,U shows a **** type internal combustion engine's (internal combustion engine which made the internal combustion engine longitudinal direction the car cross direction, and carried in the car) exhaust pipe equipment and shows it to drawing 5 R>5 To partial 22a which crosses the engine revolving-shaft heart 23 among exhaust pipes 22, and is prolonged crosswise [car], a flexible tube 24 is arranged in this partial 22a and this direction. The exhaust pipe equipment it was made to absorb roll vibration (for a sign 25 to show the roll direction) of the **** type internal combustion engine 21 is indicated without being accompanied

by most torsion of a flexible tube 24.

[0003]

[Problem(s) to be Solved by the Invention] However, when the conventional oscillating absorber is applied to the horizontal type internal combustion engine's (internal combustion engine which ****ed the internal combustion engine longitudinal direction crosswise [car], and carried in the car) 26 exhaust pipe equipment, as shown in drawing 6 partial 22a prolonged crosswise [car] among exhaust pipes 22 at the time of roll vibration of an internal combustion engine 26 (a sign 27 shows the roll direction) -- everything but bending -- twisting (torsion of the same include angle as the include angle of roll vibration of an internal combustion engine) -- it is generated and torsion starts a flexible tube 24. Although a flexible tube 24 can miss bending vibration by ** for bending, since it does not have an oscillating screening effect in torsion by **, while the oscillating reduction effectiveness of an exhaust pipe falls, there is a problem that the endurance of flexible tube 24 the very thing falls. The technical problem or the purpose of this invention is to offer the exhaust pipe equipment for horizontal type internal combustion engines which can absorb vibration of the exhaust air system at the time of roll vibration of an internal combustion engine, without hardly applying torsion to an oscillating breaker style.

[0004]

[Means for Solving the Problem] This invention which attains the above-mentioned technical problem or the purpose is as follows. The exhaust pipe equipment for internal combustion engines which was the exhaust pipe which is connected to a horizontal type internal combustion engine, and has crosswise [car] the deflection at which it turns aslant, and exhaust pipe equipment equipped with the oscillating breaker style arranged in the middle of an exhaust-air system for internal combustion engines, and doubled the shaft orientations of said oscillating breaker style with vertical-plane inboard including said principal axis of moment mostly while having arranged said oscillating breaker style by plane view to the principal-axis-of-moment top of said exhaust pipe equipment, or the latest of a principal axis of moment.

[0005] When a horizontal type internal combustion engine does roll vibration (rotational vibration of the circumference of the chief engineer hand directional-axis heart), exhaust pipe equipment carries out bending vibration within the vertical plane which includes a principal axis of moment as the whole, and the torsional oscillation of the circumference of a principal axis of moment hardly happens. Therefore, to the oscillating breaker style arranged almost according to the inside of the vertical plane which is arranged at the principal-axis-of-moment top of exhaust pipe equipment, or its latest, and is prolonged in a car cross direction in the oscillating absorption direction, torsion can hardly start at the time of roll vibration of a horizontal type internal combustion engine, but an oscillating breaker style can absorb effectively the bending vibration of the exhaust pipe equipment at the time of internal combustion engine roll vibration. Moreover, torsion of endurance of the oscillating breaker style itself improves by hardly starting.

[0006]

[Embodiment of the Invention] The exhaust pipe equipment of the internal combustion engine of this invention example is explained with reference to drawing 1 – drawing 4. As shown in drawing 1 and drawing 2, the exhaust pipe equipment 1 for internal combustion engines of this invention example The exhaust pipes 7, 8, and 9 which are connected to the horizontal type internal combustion engine 13 of FF vehicle (front engine front-drive vehicle), and have crosswise [car] the deflection 15 at which it turns aslant, It has the masses 3, 4, and 6 prepared in the middle of the oscillating breaker styles 12 and 5 (the 1st oscillating breaker style 12, the 2nd oscillating breaker style 5) arranged in the middle of and an exhaust air system. [an exhaust air system] The oscillating breaker styles 12 and 5 are the plane view of drawing 1, and are arranged at the principal-axis-of-moment (what is main shaft of moment of inertia and is mostly prolonged in car cross direction) 11 top of exhaust pipe equipment 1, or the latest of a principal axis of moment 11. Moreover, the shaft orientations of the oscillating breaker styles 12 and 5 are mostly doubled with vertical plane inboard including a principal axis of moment 11.

[0007] Exhaust pipe equipment 1 consists of connection of EKIZOSUTOMANIHORUDO a, the front assembly b, the tail pipe assembly c, and **. The front assembly b is connected with an internal combustion engine's 13 EKIZOSUTOMANIHORUDO a by the connection flange 2. The

1st oscillating breaker style 12 is formed directly under the connection flange 2. The 2nd oscillating breaker style 5 is formed in the connection section of the front assembly b and the tail pipe assembly c.

[0008] The front assembly b consists of a catalytic converter 3, a submuffler 4, and exhaust pipes 7, 8, and 9 that connect these. Moreover, the tail pipe assembly c consists of a Maine muffler 6 and a tail pipe 10. A catalytic converter 3, the submuffler 4, and the Maine muffler 6 are heavy lifts compared with other components, and constitute the mass (mass object) of an exhaust air system. Moreover, exhaust pipes 7, 8, and 9 are the range of the front assembly b and the tail pipe assembly c, and serve as an offset design of d from the constraint on car loading, and it has the deflection 15 at which it turns aslant crosswise [car] for offset. In drawing 1 and drawing 2, one line has shown EKIZOSUTOMANIHORUDOa and exhaust pipes 7, 8, and 9, respectively.

[0009] The oscillating breaker styles 12 and 5 consist of a device which can absorb the bending vibration of a system (it misses), and a flexible joint or a swivel joint is used. A flexible joint is used for the 1st oscillating breaker style 12 by the side of before, and a swivel joint is used for the 2nd oscillating breaker style 5 on the backside.

[0010] The flexible joint which constitutes the 1st oscillating breaker style 12 As shown in drawing 3, the swivel joint which connects airtightly two tubing elements 12a and 12b by bellows 12c, and constitutes the 2nd oscillating breaker style 5 As shown in drawing 4, two tubing elements 5a and 5b are connected by two bolt 5e and nut 5f on both sides of spherical-surface gasket 5c, and it consists of what allotted spring 5d to the circumference of bolt 5e.

[0011] the vertical direction produced into the part prolonged in the vertical direction of an exhaust pipe 7 when the 1st oscillating breaker style 12 which consists of a flexible joint has turned shaft orientations in the vertical direction and an internal combustion engine does roll vibration (a sign 14 shows the direction of roll vibration) -- a variation rate is absorbed by shaft-orientations **** compression of bellows 12c -- it is made like (it misses).

[0012] the 2nd oscillating breaker style 5 which consists of a swivel joint absorbs the vertical direction bending vibration produced in an exhaust pipe 9 by the direction crookedness of bending of a swivel joint 5, when shaft orientations are mostly doubled in the direction of a principal axis of moment 11, an internal combustion engine does roll vibration and vibration of the whole exhaust air system is amplified by **** return of the spring-mass system of an exhaust pipe 9 and the Maine muffler 6 -- it has been made like (it misses).

[0013] Below, an operation is explained. If roll vibration (a sign 14 shows the direction of roll vibration) of the horizontal type internal combustion engine 13 joins exhaust pipe equipment 1, by shaft-orientations **** compression of bellows 12c, vibration will be effectively absorbed by the 1st oscillating breaker style 12 set up near the principal axis of moment 11, and oscillating transfer at a posterior part will be reduced from it. Therefore, a hind amplitude becomes small from the 1st oscillating breaker style 12.

[0014] Moreover, especially when roll vibration of an internal combustion engine 13 is large, it is influenced of the mass (Maine muffler 6) of exhaust pipe back. Although vibration of the whole exhaust air system is especially amplified by **** return of the spring-mass system of an exhaust pipe 9 and the Maine muffler 6, the 2nd oscillating breaker style 5 absorbs this **** return vibration, and suppresses oscillating magnification.

[0015] In the above-mentioned oscillating absorption, although it is going to carry out bending vibration within the vertical plane in which the whole exhaust air system includes a principal axis of moment 11, since the 1st oscillating breaker style 12 and the 2nd oscillating breaker style 5 are in a principal-axis-of-moment 11 top or its latest, torsion does not start the 1st oscillating breaker style 12 and the 2nd oscillating breaker style 5, it hardly starts, but bending or **** compression mainly starts. Since the 1st oscillating breaker style 12 and the 2nd oscillating breaker style 5 consist of a flexible joint and a swivel joint and both joint absorbs bending and **** compression reasonable, vibration of the whole exhaust air system is reduced effectively. If a flexible joint and a swivel joint are **, and have almost no oscillating absorption effect to torsion but torsion starts, endurance will fall, but since the 1st oscillating breaker style 12 and the 2nd oscillating breaker style 5 hardly require torsion, endurance also improves.

[0016]

[Effect of the Invention] Since the oscillating breaker style has arranged to the principal-axis-of-moment top of exhaust pipe equipment, or its latest and the oscillating absorption direction of an oscillating breaker style has arranged almost according to the inside of the vertical plane prolonged in a car cross direction according to the exhaust pipe equipment of this invention for internal combustion engines, torsion can hardly start an oscillating breaker style at the time of roll vibration of a horizontal type internal combustion engine, but an oscillating breaker style can absorb effectively the bending vibration of the exhaust pipe equipment at the time of internal combustion engine roll vibration. Moreover, torsion can improve the endurance of the oscillating breaker style itself by hardly starting.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the top view of the exhaust pipe equipment for internal combustion engines of this invention example.

[Drawing 2] It is the side elevation of the exhaust pipe equipment for internal combustion engines of drawing 1 .

[Drawing 3] It is the sectional view of a flexible joint used as a 1st oscillating breaker style of the equipment of drawing 1 .

[Drawing 4] It is the half section side elevation of a swivel joint used as a 2nd oscillating breaker style of the equipment of drawing 1 .

[Drawing 5] It is the top view of the conventional **** type internal combustion engine's exhaust pipe equipment.

[Drawing 6] It is the top view of the exhaust pipe equipment of imagination at the time of applying the oscillating breaker style arrangement in the conventional **** type internal combustion engine's exhaust pipe equipment to a horizontal type internal combustion engine's exhaust pipe equipment.

[Description of Notations]

- 1 Exhaust Pipe Equipment
- 2 Conclusion Flange
- 3 Catalytic Converter
- 4 SubMuffler
- 5 2nd Oscillating Breaker Style (Swivel Joint)
- 6 Maine Muffler
- 7, 8, 9 Exhaust pipe
- 11 Principal Axis of Moment
- 12 1st Oscillating Breaker Style (Flexible Joint)
- 13 Internal Combustion Engine
- 14 The Roll Oscillating Direction

15 Deflection

[Translation done.]

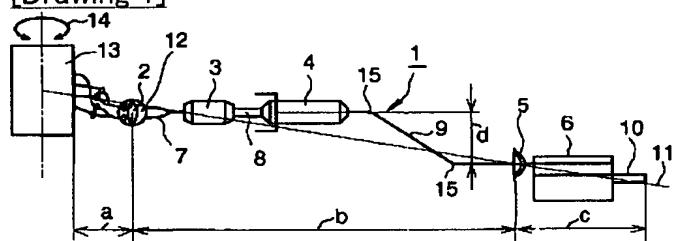
* NOTICES *

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

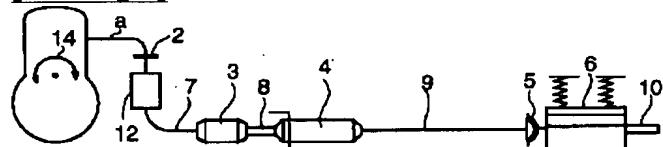
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

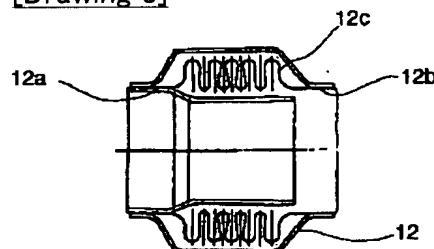
[Drawing 1]



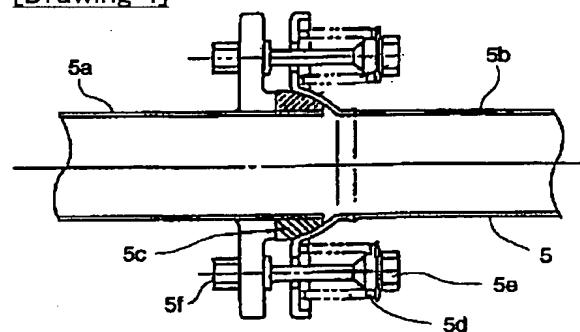
[Drawing 2]



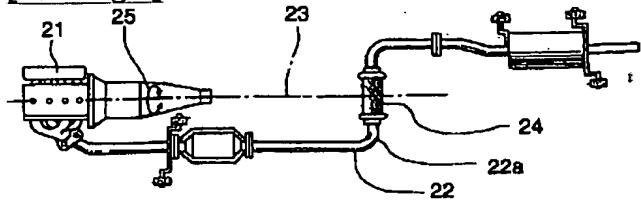
[Drawing 3]



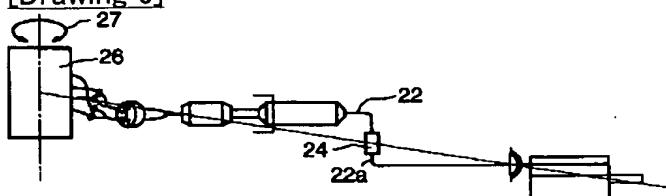
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]

(19) 日本国特許庁 (JP)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平10-196358

(43) 公開日 平成10年(1998)7月28日

(51) Int.Cl.⁶
F 01 N 7/08

識別記号

F 16 L 27/12

F I
F 01 N 7/08
F 16 L 27/12

Z
F
B
J

審査請求 未請求 請求項の数1 O.L. (全4頁)

(21) 出願番号 特願平9-3103

(22) 出願日 平成9年(1997)1月10日

(71) 出願人 000003207

トヨタ自動車株式会社
愛知県豊田市トヨタ町1番地

(72) 発明者 下地 浩二
愛知県豊田市トヨタ町1番地 トヨタ自動車株式会社内

(72) 発明者 高野 正憲
愛知県豊田市トヨタ町1番地 トヨタ自動車株式会社内

(72) 発明者 今川 利之
愛知県豊田市トヨタ町1番地 トヨタ自動車株式会社内

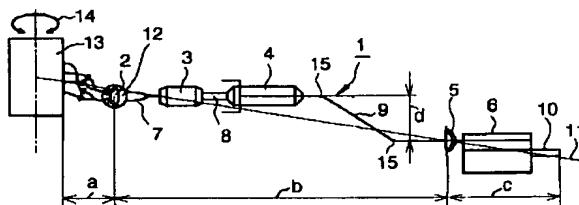
(74) 代理人 弁理士 田渕 綱雄

(54) 【発明の名称】 内燃機関用排気管装置

(57) 【要約】

【課題】 振動遮断機構にねじりをかけない内燃機関用排気管装置の提供。

【解決手段】 横置式内燃機関13に接続され、車両幅方向に斜めに曲がる曲がり15をもつ排気管7、8、9と、排気系の途中に振動遮断機構12、9を備えている内燃機関用排気管装置1であって、振動遮断機構12、9を、排気管装置1の慣性主軸11上またはその直近に配置し、かつ振動遮断機構12、9の軸方向を慣性主軸11を含む鉛直面内にほぼ合わせた内燃機関用排気管装置1。



【特許請求の範囲】

【請求項1】 横置式内燃機関に接続され、車両幅方向に斜めに曲がる曲がりをもつ排気管と、排気系の途中に配置された振動遮断機構を備えている内燃機関用排気管装置において、前記振動遮断機構を平面視で前記排気管装置の慣性主軸上または慣性主軸の直近に配置するとともに、前記振動遮断機構の軸方向を前記慣性主軸を含む鉛直面内方向にはほぼ合わせたことを特徴とする内燃機関用排気管装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、横置式内燃機関の排気管装置に関する。

【0002】

【従来の技術】実開平2-103119号公報は、縦置式内燃機関（内燃機関長手方向を車両前後方向にして車両に搭載した内燃機関）の排気管装置を示しており、図5に示すように、排気管22のうちエンジン回転軸芯23を横切って車両幅方向に延びる部分22aに、該部分22aと同方向にフレキシブルチューブ24を配置して、フレキシブルチューブ24のねじりをほとんど伴なうことなく、縦置式内燃機関21のロール振動（ロール方向を符号25で示す）を吸収するようにした排気管装置を開示している。

【0003】

【発明が解決しようとする課題】しかし、従来の振動吸収装置を横置式内燃機関（内燃機関長手方向を車両幅方向にして車両に搭載した内燃機関）26の排気管装置に適用した場合、図6に示すように、内燃機関26のロール振動時（ロール方向を符号27で示す）に排気管22のうち車両幅方向に延びる部分22aには曲げの他にねじり（内燃機関のロール振動の角度と同じ角度のねじり）が生じ、フレキシブルチューブ24にねじりがかかる。フレキシブルチューブ24は曲げには柔で曲げ振動を逃がすことができるが、ねじりには剛で振動遮断効果をもたないので、排気管の振動低減効果が低下するとともに、フレキシブルチューブ24自体の耐久性が低下するという問題がある。本発明の課題または目的は、振動遮断機構にほとんどねじりをかけずに内燃機関のロール振動時の排気系の振動を吸収することができる横置式内燃機関用排気管装置を提供することにある。

【0004】

【課題を解決するための手段】上記課題または目的を達成する本発明はつきの通りである。横置式内燃機関に接続され、車両幅方向に斜めに曲がる曲がりをもつ排気管と、排気系の途中に配置された振動遮断機構を備えている内燃機関用排気管装置であって、前記振動遮断機構を平面視で前記排気管装置の慣性主軸上または慣性主軸の直近に配置するとともに、前記振動遮断機構の軸方向を前記慣性主軸を含む鉛直面内方向にはほぼ合わせた内燃機

10

20

30

40

50

関用排気管装置。

【0005】横置式内燃機関がロール振動（機関長手方向軸芯まわりの回転振動）したとき、排気管装置は全体としては慣性主軸を含む鉛直面内で曲げ振動をし、慣性主軸まわりのねじり振動はほとんど起こらない。したがって、排気管装置の慣性主軸上またはその直近に配置されかつ振動吸収方向を車両前後方向に延びる鉛直面内にほぼ合わせて配置された振動遮断機構には、横置式内燃機関のロール振動時にねじりがほとんどかからず、振動遮断機構は内燃機関ロール振動時の排気管装置の曲げ振動を効果的に吸収することができる。また、ねじりがほとんどかからないことによって振動遮断機構自体の耐久性も向上する。

【0006】

【発明の実施の形態】本発明実施例の内燃機関の排気管装置を図1～図4を参照して説明する。図1および図2に示すように、本発明実施例の内燃機関用排気管装置1は、FF車（フロントエンジンフロントドライブ車）の横置式内燃機関13に接続され、車両幅方向に斜めに曲がる曲がり15をもつ排気管7、8、9と、排気系の途中に配置された振動遮断機構12、5（第1振動遮断機構12、第2振動遮断機構5）と、排気系の途中に設けられたマス3、4、6と、を備えている。振動遮断機構12、5は、図1の平面視で、排気管装置1の慣性主軸（慣性モーメントの主軸で、ほぼ車両前後方向に延びるもの）11上または慣性主軸11の直近に配置されている。また、振動遮断機構12、5の軸方向は慣性主軸11を含む鉛直面内方向にはほぼ合わせられている。

【0007】排気管装置1は、エキゾストマニホールドaと、フロントアッセンブリbと、テールパイプアッセンブリcとの連結からなる。フロントアッセンブリbは内燃機関13のエキゾストマニホールドaに連結フランジ2で連結されている。第1振動遮断機構12は、連結フランジ2の直下に設けられている。第2振動遮断機構5は、フロントアッセンブリbとテールパイプアッセンブリcとの連結部に設けられている。

【0008】フロントアッセンブリbは、触媒コンバータ3、サブマフラ4、およびこれらを接続する排気管7、8、9で構成される。また、テールパイプアッセンブリcはメインマフラ6、テールパイプ10で構成される。触媒コンバータ3、サブマフラ4、メインマフラ6は他の部品に比べて重量物であり、排気系のマス（質量体）を構成する。また、排気管7、8、9は、フロントアッセンブリbとテールパイプアッセンブリcの範囲で、車両搭載上の制約からdのオフセット設計となっており、オフセットのために車両幅方向に斜めに曲がる曲がり15を有している。図1、図2では、エキゾストマニホールドa、排気管7、8、9は、それぞれ1本の線で示してある。

【0009】振動遮断機構12、5は、系の曲げ振動を

吸収する（逃がす）ことができる機構からなり、フレキシブルジョイントまたはボールジョイントが使用される。前側の第1振動遮断機構12にはフレキシブルジョイントが用いられ、後側の第2振動遮断機構5にはボールジョイントが用いられる。

【0010】第1振動遮断機構12を構成するフレキシブルジョイントは、図3に示すように、2つの管要素12a、12bをベローズ12cで気密に連結したものであり、第2振動遮断機構5を構成するボールジョイントは、図4に示すように、2つの管要素5a、5bを球面ガスケット5cを挟んで2つのボルト5e、ナット5fで連結し、ボルト5eまわりにスプリング5dを配したものからなる。

【0011】フレキシブルジョイントからなる第1振動遮断機構12は軸方向を上下方向に向けてあり、内燃機関がロール振動（ロール振動の方向を符号14で示す）した時に排気管7の上下方向に延びる部分に生じる上下方向変位をベローズ12cの軸方向引張圧縮で吸収する（逃がす）ようにしてある。

【0012】ボールジョイントからなる第2振動遮断機構5は軸方向を慣性主軸11の方向にほぼ合わせてあり、内燃機関がロール振動した時に排気管9とメインマフラー6のバネーマス系の振り返しにより排気系全体の振動が増幅される時に排気管9に生じる上下方向曲げ振動を、ボールジョイント5の曲げ方向屈曲で吸収する（逃がす）ようにしてある。

【0013】つぎに、作用を説明する。横置式内燃機関13のロール振動（ロール振動の方向を符号14で示す）が排気管装置1に加わると、慣性主軸11の近傍に設定した第1振動遮断機構12により、ベローズ12cの軸方向引張圧縮により、振動が効果的に吸収され、それより後部への振動伝達が低減される。したがって、第1振動遮断機構12より後部の振動振幅が小さくなる。

【0014】また、内燃機関13のロール振動が大きい場合には、とくに排気管後方のマス（メインマフラー6）の影響も受ける。とくに、排気管9とメインマフラー6のバネーマス系の振り返しにより、排気系全体の振動が増幅されるが、第2振動遮断機構5はこの振り返し振動を吸収し、振動増幅を抑える。

【0015】上記振動吸収においては、排気系全体が慣性主軸11を含む鉛直面内で曲げ振動しようとするが、第1振動遮断機構12、第2振動遮断機構5が慣性主軸11上かその直近にあるので、第1振動遮断機構12、第2振動遮断機構5にはねじりがかかるのかからないか、またはほとんどかからず、主に曲げか引張圧縮がかかる。第1

振動遮断機構12、第2振動遮断機構5はフレキシブルジョイント、ボールジョイントからなり、両ジョイントとも曲げ、引張圧縮を無理なく吸収するので、排気系全体の振動が効果的に低減される。フレキシブルジョイント、ボールジョイントはねじりに対しては剛で、振動吸収効果をほとんどもたず、ねじりがかかると耐久性が低下するが、第1振動遮断機構12、第2振動遮断機構5ともねじりがほとんどかからないので、耐久性も向上される。

【0016】

【発明の効果】本発明の内燃機関用排気管装置によれば、振動遮断機構を排気管装置の慣性主軸上またはその直近に配置しかつ振動遮断機構の振動吸収方向を車両前後方向に延びる鉛直面内にほぼ合わせて配置したので、横置式内燃機関のロール振動時に振動遮断機構にねじりがほとんどかからず、振動遮断機構は内燃機関ロール振動時の排気管装置の曲げ振動を効果的に吸収することができる。また、ねじりがほとんどかからないことによって振動遮断機構自体の耐久性を向上することができる。

【図面の簡単な説明】

【図1】本発明実施例の内燃機関用排気管装置の平面図である。

【図2】図1の内燃機関用排気管装置の側面図である。

【図3】図1の装置の第1振動遮断機構として用いられるフレキシブルジョイントの断面図である。

【図4】図1の装置の第2振動遮断機構として用いられるボールジョイントの半断面側面図である。

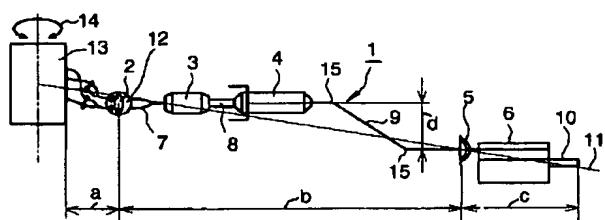
【図5】従来の縦置式内燃機関の排気管装置の平面図である。

【図6】従来の縦置式内燃機関の排気管装置における振動遮断機構配置を横置式内燃機関の排気管装置に適用した場合の仮想の排気管装置の平面図である。

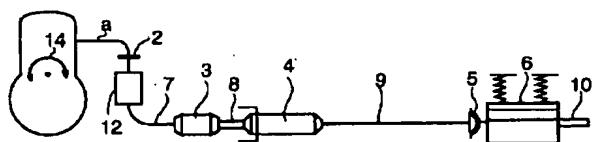
【符号の説明】

- 1 排気管装置
- 2 締結フランジ
- 3 触媒コンバータ
- 4 サブマフラー
- 5 第2振動遮断機構（ボールジョイント）
- 6 メインマフラー
- 7、8、9 排気管
- 11 慣性主軸
- 12 第1振動遮断機構（フレキシブルジョイント）
- 13 内燃機関
- 14 ロール振動方向
- 15 曲がり

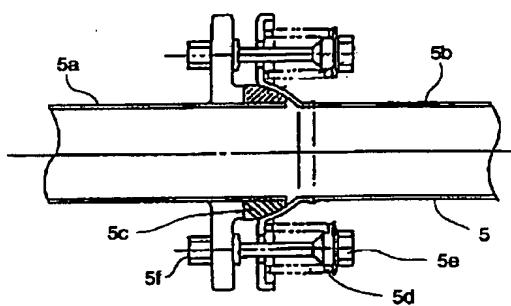
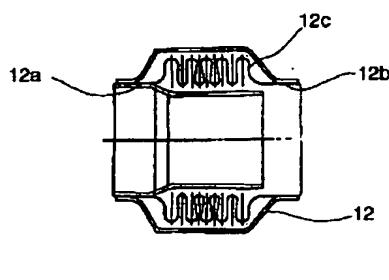
【図1】



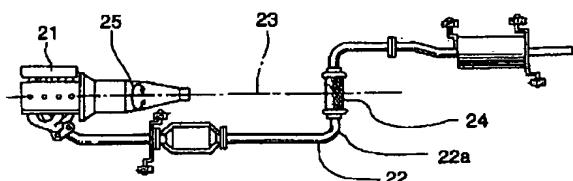
【図2】



【図3】



【図5】



【図6】

